

## Abstract

An efficient, high-quality interference analysis taking into consideration characteristics of adaptive antennas is made possible by a frequency planning device and, respectively, a method for interference analysis for a mobile radio network exhibiting an adaptive antenna in at least some of its cells (figure 4  $BS_i$ ) comprising traffic channels and control channels

- in which (figure 6) for the mobile radio network frequency allocation planning, in each case the interference ratio ( $C/I$  or  $I_{i,j}$ ) of the interference ( $I$ ) of the traffic channels (11;12 ... 18 in figure 3 and  $BS_i$ ,  $BS_j$  in figure 6) of an adaptive antenna of a first cell ( $BS_j$ ) with traffic channels of an adaptive antenna of a second cell ( $BS_i$ ) is calculated as a sum of the interference probabilities ( $Prob \{MS \text{ in beam } b\} \cdot Prob (MS \text{ in beam } a) \cdot I_{ib,jo}$ )

weighted with the traffic values of the individual part-cells, of the interferences of in each case one traffic channel of the adaptive antenna of the first cell with a user signal of in each case one traffic channel of the adaptive antenna of the second cell,

- in which (figure 5) the interference ratio ( $I_{ij}$ ) of the interference of a traffic channel of a first cell ( $BS_j$ ), without adaptive antenna with traffic channels of a second cell ( $BS_i$ ) with an adaptive antenna is calculated as the sum of the interference probabilities ( $Prob (MS \text{ in beam } b) \cdot I_{ib,t}$ ), weighted with the traffic values

of the individual part cells, of the interferences of a traffic channel of the first cell ( $BS_j$ ) with in each case one traffic channel (19, 20, 21) of the adaptive antenna of the second cell ( $BS_i$ ),

- in which (figure 7) the interference ratio of the interference of a control channel of a first cell ( $BS_i$ ) with or without adaptive antenna with a control channel of a second cell ( $BS_j$ ) with or without adaptive antenna referred to the total cell area is calculated from the user signal/interference signal ratio ( $(I_{j,t})_{tb}$ ) of these control channels in the total cell area in each case without taking into consideration any adaptive antennas of one or both of these cells ( $BS_j$ ,  $BS_i$ ).